HARBOR OF PORTLAND, MAINE.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING

A report and survey of the harbor of Portland, in the State of Maine.

JUNE 18, 1834.
Read, and laid upon the table.

In the House of Representatives U. S.
June 11, 1834.

On motion of Mr. Francis O. J. Smith,

Resolved, That the Secretary of War be directed to communicate to this House a copy of the report of the survey recently made of the harbor of Portland, Maine, by Col. Anderson, with a copy of the map and profile of the said harbor, and breakwater proposed to be constructed therein; also, copies of each preceding survey which has been made of said harbor, and now on file in the War Department.

Attest: WALTER S. FRANKLIN,
Clerk Ho. of Reps.

War Department,
June 17, 1834.

Sir: I have the honor to transmit, herewith, a report from the officer in charge of the topographical bureau, together with a report and survey of the harbor at Portland, Maine, being a part of the information called for by a resolution of the House of Representatives of the 11th instant.

Very respectfully,
Your most obedient servant,
LEW. CASS.

Hon. John Bell,
Speaker of the Ho. of Reps.

[Gales & Seaton, print.]

TOPOGRAPHICAL BUREAU,
June 14, 1834.

SIR: I have the honor to lay before you the report and drawings of the survey of the harbor of Portland, Maine, called for by a resolution of the House of Representatives of the 11th instant.

Very respectfully, sir,
Your obedient servant,
JOHN J. ABERT,
Lt. Col. Top. Engs.

Hon. LEWIS CASS,
Secretary of War.

* * *

Report on the survey of Stanford's ledge, Portland harbor, Maine, 1832.

In compliance with an order of the department, (of which the following is an extract, to wit:

"TOPOGRAPHICAL BUREAU,
"*City of Washington, November* 1, 1832.

"SIR: The Secretary of War directs that as soon as practicable you will cause Spring point, otherwise called Stanford's ledge, in Portland harbor, Maine, to be surveyed, with a view to a plan and estimate of the cost of erecting a sea-wall or breakwater upon it," &c.) I proceeded, on the 12th of November, from this (Weymouth, Mass.) to Portland, and after consulting with the collector of that port (Gen. Chandler) and a number of other gentlemen of the city, who were well informed on the subject of the survey, and who were able and willing to render me every facility in their power, I commenced the survey with the compass and chain around Cape Elizabeth, as far south of Fort Preble as was thought necessary; made an accurate survey of the north shore of the harbor, and around Mount Joy, and Back cove, so as to connect the actual survey with Westbrook. From base lines established, from thus accurately traversing the shores, a very minute trigonometrical survey (with the theodolite) was made in order to ascertain the localities of the islands and important points of the coast, as well as to ascertain the position of the ledges, shoals, and relative depth of the water in the harbor and channels leading to it. In the hydraulic survey great pains were taken in placing flags and planting buoys on the ledges, shoals, and borders of the channels, and the soundings so multiplied as to ascertain with a great degree of accuracy the depth of water and the shape of the bottom of the harbor and channels. Stanford's ledge, the middle ground, and the bar extending across the mouth of the inner harbor, were more particularly attended to, and the progressive rise and fall of the tides minutely marked during the time of taking the soundings on the more important points, as was also the nature of the bottom minutely ascertained by means of inserting an iron rod into the mud or soft earth to find its depth. From these data the map, profiles, and plans accompanying the memoir have been very accurately drawn by Lieut. Poole, and on which the estimates of the quantity of materials and the expense of the sea-walls or breakwaters have been predicated, as follows:

TABLE showing the contents, price of materials, and total expense of the proposed sea-wall or breakwater on Stanford's ledge, in the harbor of Portland, Maine.

DIVISIONS.	Length in yards.	Cubic yards of rubble stone in the body of the work.	Price per cubic yard.	Cost.	Cubic yards of stone in the top of the wall.	Price per cubic yard.	Cost.	Amount.
A, B, - -	401,333	10,158,651	81	8,228 51	1,679,715	1 35	2,267 61	10,496 12
B, C, - -	114,355	6,323,051	81	5,122 04	478,754	1 35	646 32	5,768 36
C, D, - -	58,000	4,044,138	81	3,275 75	242,749	1 35	327 71	3,603 46
D, E, - -	49,111	2,778,777	81	2,250 81	201,841	1 35	272 48	2,523 29
E, F, - -	66,000	3,795,447	81	3,074 31	276,232	1 35	372 92	3,447 23
F, G, - -	27,868	2,251,045	81	1,823 35	116,491	1 35	157 26	1,980 61
G, H, - -	125,416	16,512,605	81	13,375 21	524,910	1 35	708 63	14,083 84
	842,083	45,864,173	-	37,149 98	3,520,692	-	4,752 93	41,902 91

As to the practicability of erecting a sea-wall or breakwater on Stanford's ledge, *there can be no doubt*, and that comparatively cheap, considering the magnitude of the work; as the materials (rubble stone) of which it is proposed to build the body of the work, can be obtained in any quantity as well as the ashlar stone for the top of the breakwater or sea-wall above high water line, within a short distance, to wit, from the shores of Little Hog island, House island, Bareze's island, and on the shore of the cape, south of the proposed work. The rubble stone forming the body of the breakwater can be transported and placed on the work for seventy-five cents per cubic perch, or eighty-one cents per cubic yard, and the ashlar stone, for the top or wall above the high water line, will cost when laid one dollar and thirty-five cents per cubic yard. By referring to the map, may be seen the position and direction of the ground plan of the proposed sea-wall or breakwater on Stanford's ledge and middle ground; and by referring to the accompanying sheet, may be seen the profiles, ground plans, and transverse sections of the same works. By inspecting the foregoing table, relative to Stanford's ledge, and the following relative to the middle ground, may be seen the length in yards of the different divisions, the cubic yards of rubble stone in the body of the work, the price per cubic yard, the cost of each division, the cubic yards of ashlar stone in the top or wall above high water line, the price per yard, the cost of each division, the amount of each division, also the total amount of the whole work, to wit, $41,902 91, for the breakwater on Stanford's ledge. $47,580 38 for the breakwater on the middle ground. To which it may be well to add six per cent. on the whole amount for contingent expenses, such as superintendence, iron for clamps for fastening the coping of the most exposed parts of the top wall, and for a pier and beacon on the outer end of the breakwater, &c., making a sum total for Stanford's ledge, $44,417 08, and for the breakwater on the middle ground, $50,435 20, making the sum of $94,852 28 for the two works projected for the defence or security of the harbor against the force of the storms and tides, from the two only vulnerable points to which it is exposed, viz. from the northeast and southeast; and it is believed that were these works erected agreeably to the projected plans, the security of the warehouses, wharfs, and vessels in the harbor, would be rendered very complete.

Having stated the practicability and probable cost of the proposed work, it remains to ascertain what may be its probable utility. During a southeast storm, at flood tides, the sea and undertow is thrown into the harbor across Stanford's ledge with tremendous force; by which the wharfs, warehouses, and shipping, have sustained and are liable to very great damages. Witness, for instance, the storm in the fall of 1831, when damages to perhaps the amount, or more than the cost of building the breakwater, were sustained during one gale. The breakwater will effectually secure the harbor from storms in this direction; and other results, which may be pretty clearly calculated on, and which will go far to demonstrate the utility of the breakwater, are, that it will tend greatly to, if not wholly, prevent the rising of the shoal or bar across the mouth of the harbor between the middle ground and Stanford's ledge, which is stated by the best authority to have risen from two to three feet in twenty-five or thirty years; and of this fact I believe there can be no doubt; there are but 2⅔ fathoms on the bar now, at low water. There can be little doubt in my mind, that the breakwater on Stanford's ledge, by so materially diverting the course of the tide, and narrowing the channel, or rather the space through which the tide ebbs and flows between Stanford's point and the middle ground, out and into the western channel, would produce the effect of not only preventing any further accumulation of alluvial deposite on the bar, but would tend gradually to remove the bar, and deepen the channel into the harbor.

It is a well known fact, that the tide continues to ebb down the northeast channel an hour or more after it commences flowing into the southwest channel across Stanfords' ledge. At the point of junction of these opposite tides, the alluvion brought by each is deposited; to which may be rationally attributed the gradual formation of the bar. Beside the foregoing tendency the breakwater will have to deepen the channel, in consequence of narrowing it, and diverting the course of the tide, it will tend to throw the point of junction of the two tides further east, where the two tides will throw their alluvial deposite into such depth of water as to prevent it ever injuring the navigation; whereas it now threatens, at some future day, to materially injure the free communication with the inner harbor, unless prevented by some artificial means; and it is believed, as before stated, that the proposed breakwater will have the effect fully to remedy the evil arising from the effect of the southeast storms, and in a great degree remove the bar.

With respect to the utility of the breakwater on the middle ground, it would undoubtedly have the effect to secure the wharfs, warehouses, and shipping, at and near them, from the violence of the storms from the northeast; it would also divert the course of the ebb tide from the northeastern channel, and throw the point of junction of the two tides (before spoken of) still further east and into deep water, as well as by narrowing the channel out of the harbor still more; would aid in increasing the velocity of the ebb tide from the southwest channel and harbor; consequently aid in not only preventing the increase of the bar, but in wearing it away.

From these considerations, there can remain but little doubt of its utility in a certain degree; but whether in a degree commensurate with its expense, I leave to those to determine, whose observations relative to the currents, winds, and tides, in and about the harbor, have been more extensive and complete than mine could be then; but from what observations I had an opportunity of making, I still believe the work, if erected, would be of very great use, and complete the defence of the harbor, as will appear by inspecting a more general map. The space between the points of these two breakwaters is completely land-locked, consequently the inner harbor (as before stated) will be rendered safe and secure, by the erection of the breakwaters.

TABLE showing the contents, price of materials, and total expense of the proposed sea-wall or breakwater on the middle ground in the harbor of Portland, Maine.

DIVISION.	Length in yards.	Cubic yds. of rubble stone in the body of the work.	Price per cubic yard.	Cost.	Cubic yds. of stone in the top of the wall.	Price per cubic yard.	Cost.	Amount.
			Cents.	*Dollars.*		*Dolls.*	*Dollars.*	*Dollars.*
I. K.	359,083	56,236,424	81	45,551 50	1,502,877	1 35	2,028 88	47,580 38

The foregoing is respectfully submitted to those better qualified to judge on the subject, than their

Obedient servant,
JOHN ANDERSON,
Lieut. Col. Top. Engs.

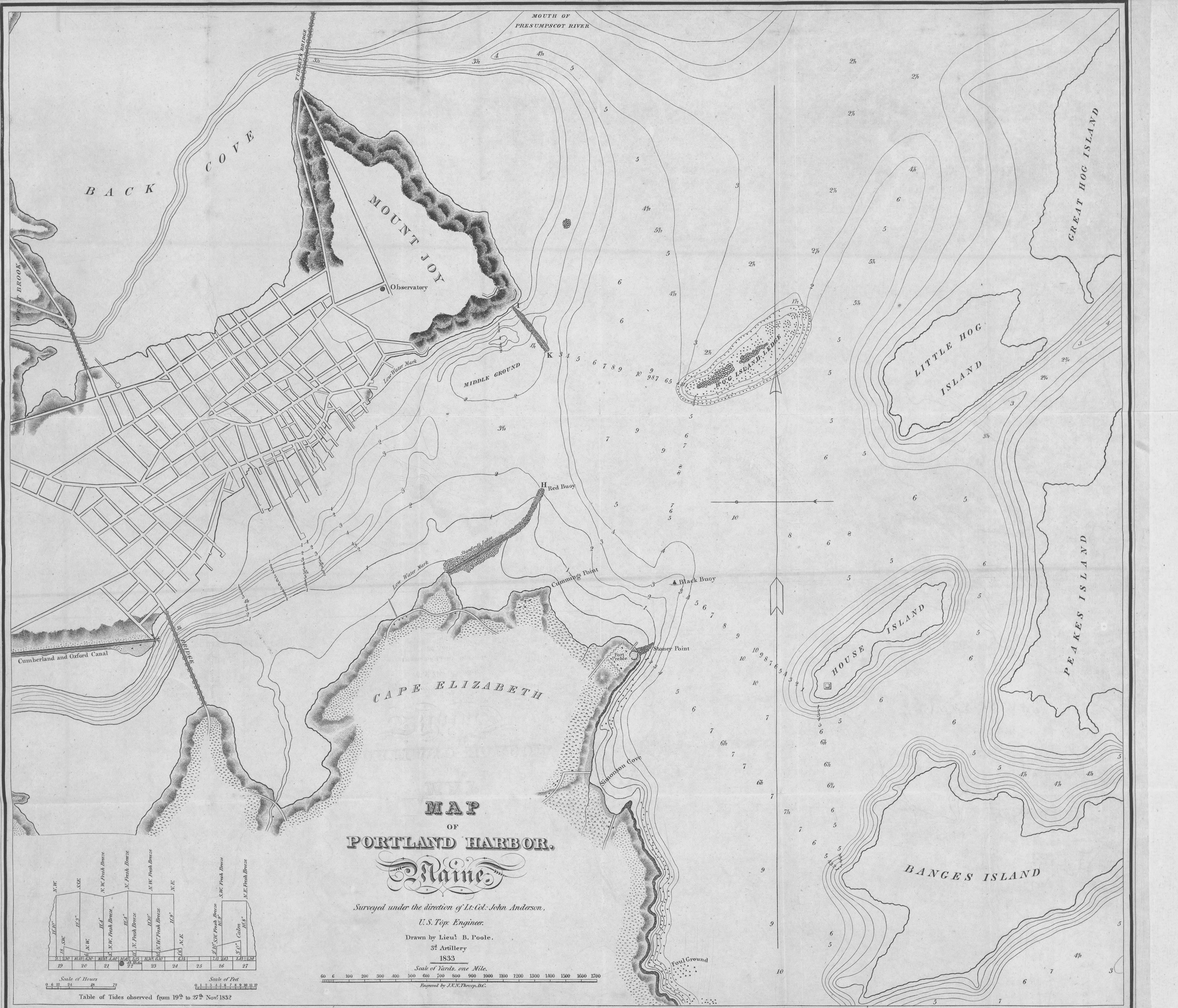


Table of Tides observed from 19th to 27th Novr. 1832

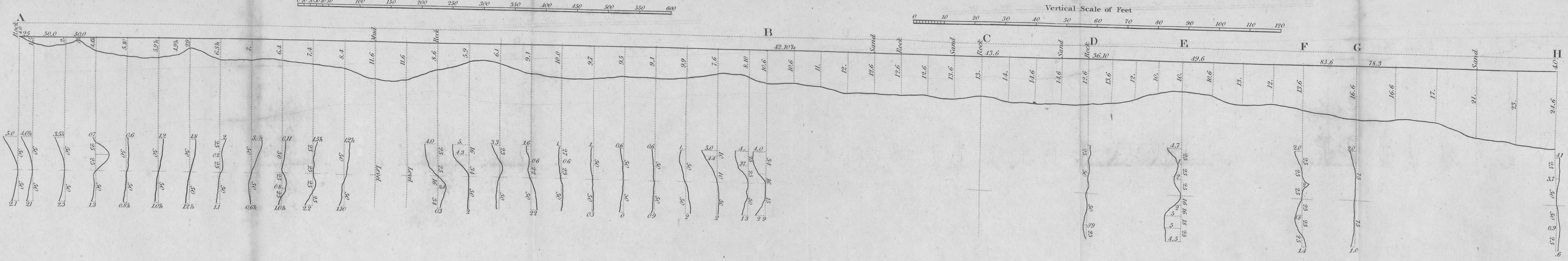
MAP
OF
PORTLAND HARBOR.
Maine

Surveyed under the direction of Lt: Col: John Anderson,
U. S. Top: Engineer.

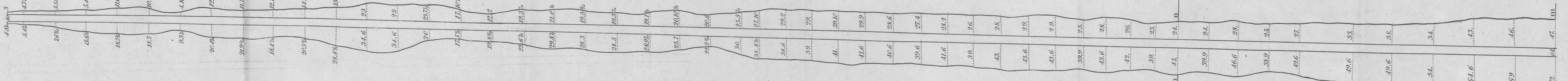
Drawn by Lieut. B. Poole,
3d Artillery
1833

Engraved by J. V. N. Throop, D.C.

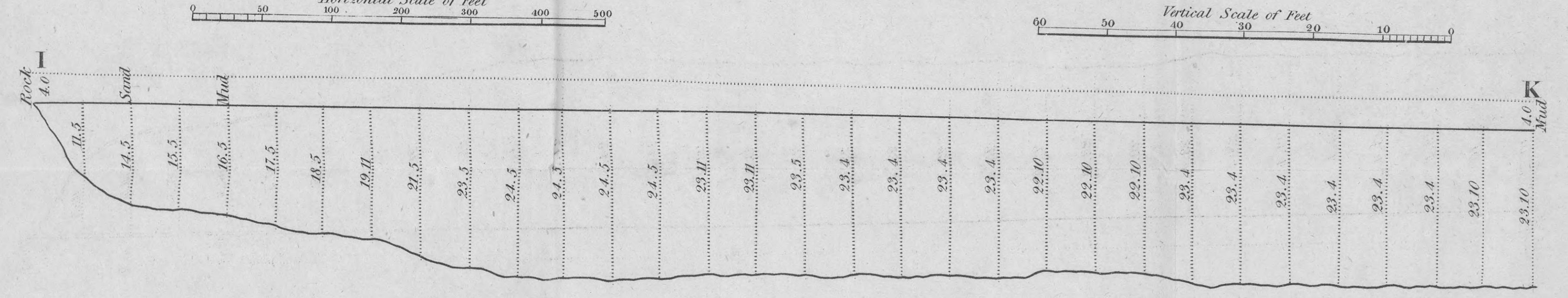
PROFILE of BREAKWATER on STANFORD'S LEDGE.



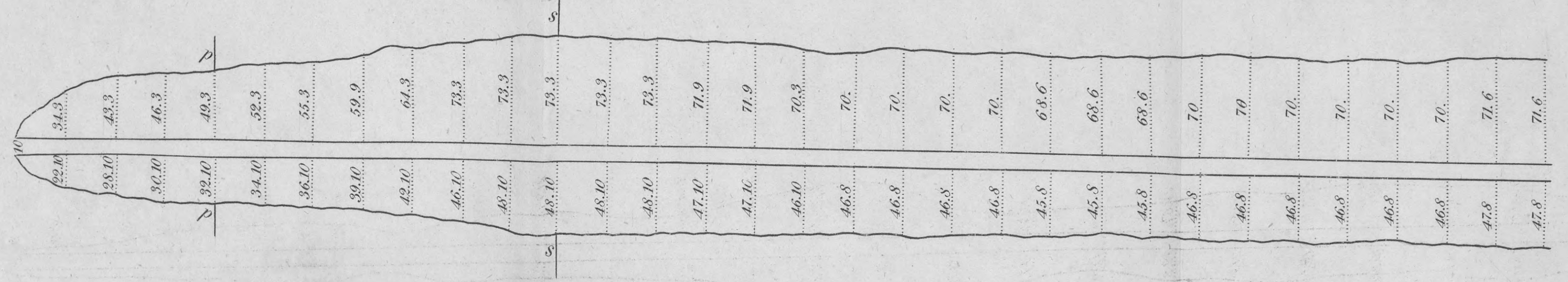
GROUND PLAN.

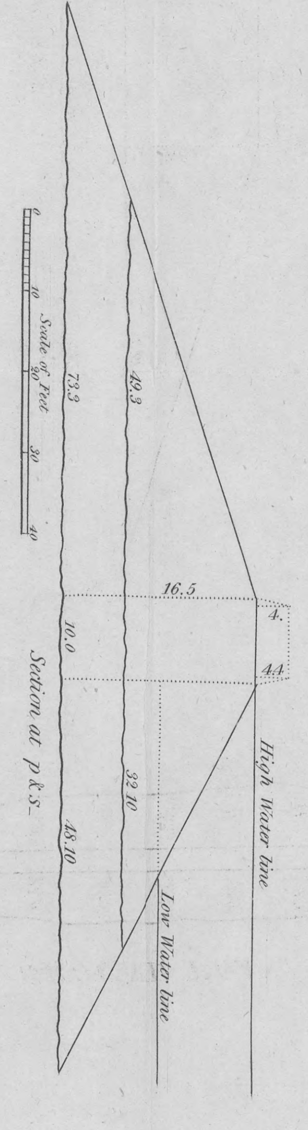


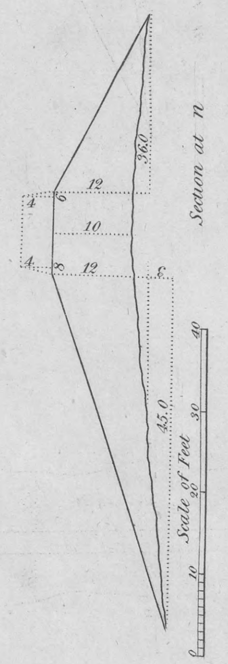
PROFILE of BREAKWATER on MIDDLE GROUND.

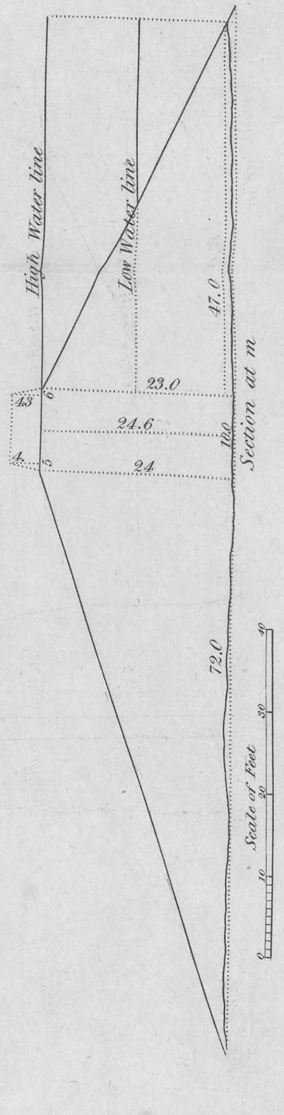


GROUND PLAN









TOPOGRAPHICAL BUREAU.
February 22d 1834
Copied by Robt Fowler. *Clerk T.B.*